

CLAIMS

1. A computer-readable medium having computer instructions for storing and managing a knowledge profile,

wherein knowledge is stored in knowledge units representative of unconstrained natural language (NL);

wherein any given knowledge unit is associatable with at least one other knowledge unit with the given knowledge unit being a context knowledge unit, and the at least one other knowledge unit being a detail knowledge unit of the associated context knowledge unit, and such that every given context knowledge unit that has at least one associated detail knowledge unit satisfies a NL relationship there-between that corresponds to one of the NL-expressible forms of the NL word “have”;

wherein the profile includes a core set of knowledge units for a core vocabulary of words, at least some of which are associated with knowledge units to provide a basic meaning of the associated words;

wherein the profile further includes a core set of knowledge units for core processing and core parsing NL-expressible knowledge;

wherein the knowledge units are arranged in accordance with a predefined structure that reflects context-detail relationships and that is dynamically extensible to include other knowledge units during run-time; and

wherein the placement and relationships of knowledge units within the predefined structure further reflect semantic interpretations of the knowledge units and support algorithmic reasoning about the knowledge in the profile.

2. The computer-readable medium of claim 1, wherein the profile includes NL class structures to form knowledge units to represent NL words and phrases.
3. The computer-readable medium of claim 2, wherein the profile includes NL word class structures to form knowledge units to represent NL words.
4. The computer-readable medium of claim 3, wherein NL word class structures have associated values, and wherein the associated values of the word class structures are spellings of the word corresponding to the NL word class structure.
5. The computer-readable medium of claim 3 wherein the word class structures include primary word class structures to represent a word with an associated spelling.
6. The computer-readable medium of claim 3 wherein some word class structures specify an immediate superclass of the word represented by the word class structure to distinguish said word from any other words having an identical spelling to said word.
7. The computer-readable medium of claim 2, wherein the profile includes qualified word class structures to form knowledge units to represent NL phrases.
8. The computer-readable medium of claim 7, wherein qualified word class structures include information to represent word forms, including irregular word forms.

9. The computer-readable medium of claim 2, wherein, to form knowledge units to represent NL phrases, the profile includes qualified word class structures and NL word class structures, and wherein a NL word class is used to represent a head word of the NL phrase and wherein qualified word class structures are used to represent a series of qualifiers of the head word in accordance with the NL phrase expression of the qualifiers.
10. The computer-readable medium of claim 9 wherein the NL word class structure for a head word is identifiable based on its positional relationship within the predefined structure in relation to the qualified word class structures and based on it being a NL word class structure.
11. The computer-readable medium of claim 9, wherein the knowledge units to represent NL phrases include qualifier class structures to represent a role of the qualifiers of the qualified word class.
12. The computer-readable medium of claim 11 wherein the role is represented by a NL word class structure and wherein a set of class structures to represent roles includes the following roles or semantic equivalents thereof: structure, string, number, quantity, determiner, tense and type.
13. The computer-readable medium of claim 11 wherein the combination of the role and the NL word class used to represent a head word represent semantics of the NL phrase.
14. The computer-readable medium of claim 9 wherein the qualified word class structures may be chained to represent arbitrary NL phrases.
15. The computer-readable medium of claim 1, wherein the predefined structure is a tree structure.

16. The computer-readable medium of claim 15 wherein the core set of knowledge units for a core vocabulary of words is organized within a sub-tree of the profile tree.
17. The computer-readable medium of claim 1 wherein the profile includes structures with a predefined structural definition and wherein detail knowledge units are formed from said structural definition and context knowledge units are formed from said structural definition, and wherein the structural definition includes information for identifying a structure to represent an associated context.
18. The computer-readable medium of claim 2 wherein the profile includes structures with a predefined structural definition and wherein detail knowledge units are formed from said structural definition and context knowledge units are formed from said structural definition, and wherein the structural definition includes information for identifying a structure to represent an associated context and wherein the structural definition includes information for identifying an associated NL class structure.
19. The computer-readable medium of claim 18 wherein the structural definition includes information for identifying associated detail structures.
20. The computer-readable medium of claim 19 wherein the information identifying associated detail structures identifies the detail structures in a canonical ordering.
21. The computer-readable medium of claim 20 wherein the identified associated detail structures each have an associated class structure and wherein the class structures have a class ID and wherein the canonical ordering is based on the class ID.

22. The computer-readable medium of claim 18 wherein the structural definition includes information for a value to specify the detail structure.
23. The computer-readable medium of claim 22 wherein the structural definition is used to form NL word class structures and wherein the value of NL word class structures is a spelling of an NL word represented by the NL class structure.
24. The computer-readable medium of claim 2 wherein the profile includes detail structures to represent instances associated with a corresponding class structure and wherein the class structure represents a kind of thing the detail represents an instance of.
25. The computer-readable medium of claim 24 wherein at least some detail structures to represent instances include associated value information, and wherein said value information is context independent meaning of the corresponding detail.
26. The computer-readable medium of claim 24 wherein specifications of class structures are substantially static, and wherein specifications of instances are modifiable.
27. The computer-readable medium of claim 26 wherein class structures specifications permit downcasting of class.
28. The computer-readable medium of claim 9 wherein the computer-readable medium includes logic to transform a knowledge unit that represents a NL phrase and comprised of a class structure for a head word and qualified class structures for a series of associated qualifiers of the head word into a semantically equivalent knowledge unit comprised of a detail structure that represents an instance of the head word NL class structure wherein said instance is specified by associated details with semantic equivalence of the associated qualifiers.

29. The computer-readable medium of claim 9 wherein the computer-readable medium includes logic to transform a detail structure that represents an instance of a head word NL class structure, wherein said instance is specified by associated details, into a semantically equivalent knowledge unit that represents a NL phrase and comprised of a class structure for a head word of the phrase and qualified class structures for a series of associated qualifiers of the head word with semantic equivalence of the associated details of the instance.

30. The computer-readable medium of claim 28 wherein the logic to transform algorithmically determines the details to specify the instance by processing the qualified word classes for the series of qualifiers of the head word.

31. The computer-readable medium of claim 1 wherein the profile is organized in accordance with predetermined rules and wherein a context knowledge unit includes a specification of detail knowledge units associated therewith and wherein the specification of detail knowledge units is canonically ordered in accordance with the predetermined rules.

32. The computer-readable medium of claim 24 wherein NL class structures are arranged in accordance with a specified class hierarchy having NL subclasses and NL superclasses, and wherein each NL class has an associated class ID, and wherein class structures are assigned class IDs in accordance with the predetermined rules, and wherein the NL class structures of the profile are canonically ordered

33. The computer-readable medium of claim 31 wherein the NL class structures include information for identifying an extent of subclasses related to the NL class represented by the NL class structure, and wherein the medium includes logic to test whether an identified NL class is a

subclass of another identified NL class by comparing the class ID of the identified NL class to the extent identifying information of the other identified NL class.

34. The computer-readable medium of claim 2

wherein each class structure of a specified set of NL class structures corresponding to invertible NL relationships has an inverse relation detail specified by a class structure representing the inverse relation; and

wherein the medium includes logic that detects if an instance detail is being specified with a relationship detail, the relation for which is in the specified set, and that automatically creates an inverse relationship detail for the instance corresponding to the relationship detail, the inverse relationship detail specifying the context detail.

35. The computer-readable medium of claim 34 wherein the medium includes logic for monitoring relationship details and automatically manages said details and corresponding inverse relation details in response to changes of either.

36. The computer-readable medium of claim 2 wherein NL class structures have an associated knowledge unit specifying details of a typical instance of a NL class represented by the NL class structure, whereby detail structures of the profile may reference one of said NL class structures with an associated typical instance, and whereby reasoning logic may infer knowledge about the instance by considering the details specified by the typical instance details.

37. The computer-readable medium of claim 2 wherein NL class structures have an associated knowledge unit specifying details of a model instance of a NL class represented by

the NL class structure, and wherein a model instance specifies important details as being necessary for automated management of any instances of the NL class.

38. The computer-readable medium of claim 37 further including logic to automatically manage instances that have specifications for important details.

39. The computer-readable medium of claim 37 further including logic to delegate management of a knowledge unit to an agent.

40. The computer-readable medium of claim 1 further including logic to export the knowledge units to a text file such that the text file has an outlined presentation preserving the associations between context knowledge units and detail knowledge units in a hierarchical form.

41. The computer-readable medium of claim 1 further including logic to import knowledge from a text file that has an outlined presentation in predefined form and that represents associations between context knowledge and detail knowledge in a hierarchical form, wherein the logic to import creates knowledge units for the context knowledge and the detail knowledge and creates associations between such created knowledge units to preserve the associations represented in the text file.

42. The computer-readable medium of claim 1 wherein the knowledge units include descriptor details that are details of a class “descriptor” and wherein the descriptor details correspond to NL adjectives, NL adjective with an adverbial modifier, a generic NL noun, a generic NL compound noun, a generic NL prepositional phrase, or a generic NL verb phrase.

43. A system for storing and managing a knowledge profile, comprising:
- a processing platform with processing and storage resources;
- wherein knowledge is stored in the storage resources as knowledge units representative of unconstrained natural language (NL);
- wherein any given knowledge unit is associatable with at least one other knowledge unit with the given knowledge unit being a context knowledge unit, and the at least one other knowledge unit being a detail knowledge unit of the associated context knowledge unit, and such that every given context knowledge unit that has at least one associated detail knowledge unit satisfies a NL relationship there-between that corresponds to one of the NL-expressible forms of the NL word “have”;
- wherein the profile is stored in the storage resources and includes a core set of knowledge units for a core vocabulary of words, at least some of which are associated with knowledge units to provide a basic meaning of the associated words;
- wherein the profile further includes a core set of knowledge units for core processing and core parsing NL-expressible knowledge;
- wherein the knowledge units are arranged in accordance with a predefined structure that reflects context-detail relationships and that is dynamically extensible to include other knowledge units during run-time; and

wherein the placement and relationships of knowledge units within the predefined structure further reflect semantic interpretations of the knowledge units and support algorithmic reasoning about the knowledge in the profile.

44. A computer-implemented method of storing and managing a knowledge profile, comprising:

storing knowledge as knowledge units representative of unconstrained natural language (NL);

wherein any given knowledge unit is associatable with at least one other knowledge unit with the given knowledge unit being a context knowledge unit, and the at least one other knowledge unit being a detail knowledge unit of the associated context knowledge unit, and such that every given context knowledge unit that has at least one associated detail knowledge unit satisfies a NL relationship there-between that corresponds to one of the NL-expressible forms of the NL word “have”;

wherein the profile includes a core set of knowledge units for a core vocabulary of words, at least some of which are associated with knowledge units to provide a basic meaning of the associated words;

wherein the profile further includes a core set of knowledge units for core processing and core parsing NL-expressible knowledge;

arranging the knowledge units in accordance with a predefined structure that reflects context-detail relationships and that is dynamically extensible to include other knowledge units during run-time; and

wherein the placement and relationships of knowledge units within the predefined structure further reflect semantic interpretations of the knowledge units and support algorithmic reasoning about the knowledge in the profile.